इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 15647 (2006): Hot rolled steel narrow width strip for selded tubes an pipes [MTD 4: Wrought Steel Products]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

भारतीय मानक

वेल्डिड नलिका एवं पाइपों के लिए तप्त बेल्लित इस्पात की लघु चौड़ाई वाली पत्ती

Indian Standard

HOT ROLLED STEEL NARROW WIDTH STRIP FOR WELDED TUBES AND PIPES

ICS 77.140.50

© BIS 2006

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

April 2006

Price Group 3

Wrought Steel Products Sectional Committee, MTD 4

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Wrought Steel Products Sectional Committee had been approved by the Metallurgical Engineering Division Council.

In India, certain small scale re-rolling mills are producing hot rolled narrow width steel strips, popularly known as Patra. Keeping the interest of these steel mills in view, a need was felt to formulate an Indian Standard to facilitate manufacture of quality hot rolled steel narrow width strip which will be used for manufacturing of welded tubes and pipes for non-critical applications.

For all the tests specified in this standard (chemical/physical/others), the method as specified in relevant ISO Standard may also be followed as an alternate method.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

For the purpose of deciding whether particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

HOT ROLLED STEEL NARROW WIDTH STRIP FOR WELDED TUBES AND PIPES

1 SCOPE

1.1 This standard covers the requirements for weldable quality hot rolled narrow width steel strip up to 600 mm for manufacture of steel pipes and tubes for non-critical applications such as low pressure water and furniture purposes.

1.2 The hot rolled narrow width steel strip manufactured as per this standard shall not be applicable for manufacture of steel pipes for pressure applications such as high pressure water, steam, oil and gases.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
228 (In Parts)	Methods of chemical analysis of steel on appropriate parts
1079 : 1994	Hot rolled carbon steel sheets and strips — Specification (*fifth revision*)
1599 : 1985	Method for bend test (*second revision*)
1608 : 2005	Metallic materials — Tensile testing at ambient temperature (*third revision*)
1730 : 1989	Dimensions for steel plates, sheets, strips and flats for general engineering purposes (*second revision*)
1852 : 1985	Rolling and cutting tolerances for hotrolled steel products (*fourth revision*)
1956 (Part 4) : 1975	Glossary of terms relating to iron and steel: Part 4 Steel sheet and strip (*first revision*)
2049 : 1978	Colour code for the identification of wrought steels for general engineering purposes (*first revision*)
3803 (Part 1) : 1989	Steel — Conversion of elongation values: Part 1 carbon and low alloy steels (*second revision*)
8910 : 1978	General technical delivery requirements for steel and steel products

3 TERMINOLOGY

For the purpose of this standard, the following definition in addition to those given in IS 1956 (Part 4) shall apply.

3.1 Narrow Width Strip — Hot rolled steel strip up to width of 600 mm, manufactured in straight length with a minimum length of 20 m and supplied as such or in the form of coil or folded strip with a minimum diameter of ten times of thickness, without welding joint.

4 SUPPLY OF MATERIAL

4.1 General requirements relating to the supply of hot rolled narrow width steel strip shall conform to IS 8910.

4.2 The material may be ordered on any of the following basis as agreed to between the manufacturer and the purchaser:

a) Chemical composition, or

b) Physical properties.

5 GRADES

There shall be three grades of hot rolled carbon steel sheet designated as Grade 1, Grade 2 and Grade 3.

6 MANUFACTURE

6.1 The processes used in making steel and in manufacturing hot rolled narrow width steel strip shall be left to the discretion of the manufacturer.

6.2 Steel shall be supplied in the killed, semi-killed or rimming conditions subject to agreement between the manufacturer and the purchaser.

7 CHEMICAL COMPOSITION

7.1 Ladle Analysis

Ladle analysis of the material to be carried out for each heat/20 tonne or part thereof either by the method specified in the relevant parts of IS 228, or any other established instrumental and chemical method shall be as given in Table 1. In case of dispute, the procedure given in IS 228 and its relevant parts shall be referee method. However, where the method is not given in IS 228 or its relevant parts, the referee method shall be as agreed to between the purchaser and the manufacturer.

7.2 Product Analysis

Permissible variations in the case of product analysis from the limits specified in Table 1 shall be as given in Table 2.

Table 1 Chemical Composition

(*Clauses* 7.1 *and* 7.2)

Grade	Consstitutent, Percent, *Max*			
	Carbon	Manganese	Sulphur	Phosphorus
(1)	(2)	(3)	(4)	(5)
1	0.10	0.50	0.04	0.04
2	0.12	0.60	0.04	0.04
3	0.16	1.20	0.04	0.04

NOTES

1 For semi-killed quality, silicon content shall be 0.08 percent maximum.

2 When the steel is aluminum killed, the total aluminum content shall not be less than 0.02 percent. When the steel is silicon killed, silicon shall not be less than 0.10 percent. When the steel is silicon-aluminium killed, the silicon content shall not be less than 0.03 percent and total aluminium content shall not be less than 0.01 percent.

3 Nitrogen content of steel shall not exceed 0.012 percent, which shall be ensured by the manufacturer by occasional check analysis.

4 Closer limits of composition shall be agreed to between the supplier and the purchaser.

Table 2 Permissible Variation for Product Analysis

(*Clause* 7.2)

Constituent	Variation Over Specified Limit, Percent, *Max*
(1)	(2)
Carbon	0.02
Manganese	0.04
Sulphur	0.004
Phosphorus	0.004
Silicon	0.005

NOTE — Product analysis shall not be applicable to rimming steel.

8 TENSILE TEST

8.1 Number of Tensile Tests

One sample shall be tested for each heat/20 tonne or part thereof per thickness per cast rolled.

8.2 Tensile Test Pieces

Tensile test samples shall be taken longitudinally to the direction of rolling. The sample for tensile test shall be taken from the end of the strip of the relevant cast.

8.3 The tensile test shall be carried out in accordance with IS 1608 as applicable, generally using a proportional gauge length $L_o = 5.65\sqrt{S_o}$. Where S_o is the cross-sectional area of the test piece. Test pieces with a non-proportional gauge length may also be used. In such case the elongation values shall be converted in accordance with IS 3803 (Part1). The tensile strength, yield strength and percentage elongation shall be as given in Table 3.

8.3.1 Should test piece break outside the middle half of the gauge length and the percentage elongation obtained is less than that specified, the test may be discarded at the option of the manufacturer and another test made from the sample selected representing the same cast and batch.

9 BEND TEST

9.1 Number of Bend Tests

One sample shall be tested for each heat/20 tonne or part thereof per thickness per cast rolled.

9.2 Bend test shall be carried out in accordance with IS 1599.

9.2.1 Bend test shall be taken transverse to the direction of rolling.

9.2.2 The test piece shall be 75 mm long and 25 mm wide for thickness less than 3 mm and not less than 40 mm wide for 3 mm and over. For small sizes the maximum width available shall be used.

9.2.3 The edge of the bend test piece shall be free from burrs. Filing or machining to remove burrs as permissible.

9.2.4 The test piece shall be bent cold through 180°. The internal diameter of the bend for the different grades of material shall be as given in Table 3. The test piece shall be deemed to have passed the test, if the outer convex surface is free from cracks.

Table 3 Mechanical Properties

(*Clauses* 8.3 *and* 9.2.4)

Grade	Tensile Strength, *Min* MPa	Yield Strength, *Min* MPa	Percentage Elongation at Gauge Length, *Min* $5.65\sqrt{S_o}$	Internal Diameter of Bend
(1)	(2)	(3)	(4)	(5)
1	290	170	30	t
2	330	210	28	$2t$
3	410	240	25	$2t$

NOTES

1 Where t is the nominal thickness of the test piece.

2 1 MPa = 1 N/mm^2 = 0.102 0 kgf/mm^2.

3 Mechanical properties other than those specified in this table may be as per agreement between the purchaser and the manufacturer for specific applications.

10 RETESTS

Should any one of the test pieces first selected fail to pass any of the tests specified in this standard two further samples shall be selected from the same lot for testing in respect of each failure. Should the test pieces from both these additional samples pass the material represented by the test, samples shall be deemed to comply with the requirement of that particular test. Should the test pieces from either of these additional test samples fail, the material represented by the test samples shall be deemed as not conforming to the standard.

11 FREEDOM FROM DEFECTS

The steel shall be free from such defects like segregation, lamination, surface flaws and others which are detrimental to subsequent processing and ultimate use.

12 DIMENSIONS AND TOLERANCES

12.1 Unless otherwise specified by the purchaser, the nominal dimensions and thickness of hot rolled narrow width steel strip shall be as specified in IS 1730.

12.2 Tolerances on thickness and width shall conform to IS 1852.

12.3 Tolerance on edge camber shall be as specified in IS 1079.

12.4 Tolerances closer than those specified in **12.1** and **12.2** on the dimensions of hot rolled narrow width steel strip may also be as agreed to between the purchaser and the manufacturer.

13 CONDITION OF NARROW WIDTH STRIPS

13.1 Unless otherwise specified by the purchaser, the material shall be in as-rolled condition without any skin passing, pickling, oiling, blast cleaning, annealing and normalizing.

13.2 The edges shall be mill edges or slit edges as agreed to between the purchaser and the manufacturer. When mill edges are specified the depth of defects shall be within 5 mm from the edges on either side.

13.3 Individual narrow width strips shall be securely tied and suitably bundled to protect them from being damaged during transit.

13.4 Colour codes for segregation of the grades of the narrow width strips produced may be devised by the manufacturers based on IS 2049.

14 MARKING

14.1 Every narrow width strips or bundle shall be legibly marked outside or inside with the following:

a) Name or trade-mark of the manufacturer,
b) Grade of steel,
c) Cast or lot number, and
d) Size.

14.2 BIS Certification Marking

The material may also be marked with the Standard Mark.

14.2.1 The use of the Standard Mark is governed by the provisions of the Bureau *of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from Bureau of Indian Standards.

15 ORDERING INFORMATION

While placing an order for hot rolled narrow width steel strips covered by this standard, the purchaser should specify clearly the following:

a) Grade,
b) Size,
c) Mass of the strip/bundle,
d) Name and trade-mark of the manufacturer, and
e) Cast or lot number.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Wrought Steel Products Sectional Committee, MTD 4

Organization	*Representative(s)*
SAIL, Rourkela Steel Plant, Rourkela	Dr Sanak Mishra (***Chairman***) Shri N. K. Sood (*Alternate*)
All India Induction Furnace Association, New Delhi	Shri R. P. Varshney Shri C. M. Kohli (*Alternate*)
Atomic Minerals Division, Hyderabad/New Delhi	Dr H. C. Arora Dr Adarsh Kumar (*Alternate*)
Bharat Heavy Electricals Ltd, Bhopal	Shri R. K. Seth Shri K. K. Gupta (*Alternate*)
Central Boilers Board, New Delhi	Shri V. K. Goel Shri M. L. Ahuja (*Alternate*)
Consumer Protection Council, Rourkela	Shri B. Vaidyanathan
Defence Metallurgical Research Lab (DMRL), Hyderabad	Shri A. V. Athavale Shri V. Lalitha Kumari (*Alternate*)
DGS&D, Bhilai Nagar	Shri S. K. Ganguly Shri B. S. Rana (*Alternate*)
Escorts R&D Centre, Faridabad	Shri Alok Nayar
Institute of Steel Development and Growth, Kolkata	Dr R. K. P. Singh Shri Jayanta Kumar Saha (*Alternate*)
Jindal South West Steel Ltd, Vasind/Vijaynagar	Shri M. K. Maheshwari Shri S. K. Hegde (*Alternate*)
M.N. Dastur & Co Ltd, Kolkata/New Delhi	Shri Subhabrata Sengupta Shri R. K. Tyagi (*Alternate*)
Ministry of Defence (DGOFB), Kolkata	Shri S. K. Ghosh Shri S. Bhattacharya (*Alternate*)
Ministry of Defence (DGQA), Ichapur	Joint Controller Quality Assurance Officer (*Alternate*)
Ministry of Railways (RDSO), Lucknow	Joint Director (Chemical) Joint Director (*Alternate*)
Ministry of Steel (Govt of India), New Delhi	Shri S. S. Saha Shri A. C. R. Das (*Alternate*)
Mukand Ltd, Thane	Shri C. H. Sharma Shri K. R. Srinivasan (*Alternate*)
National Metallurgical Laboratory, Jamshedpur	Dr S. Tarafdar Dr R. Gopal Krishnan (*Alternate*)
National Physical Laboratory, New Delhi	Dr Anil Kumar Gupta Shri R. C. Anandani (*Alternate*)
Nuclear Fuel Complex, Hyderabad	Shri B. Gopalan
Power Grid Corporation, Gurgaon	Shri K. K. Agrawal Shri Anil Agrawal (*Alternate*)
Rashtriya Ispat Nigam Ltd (VSP), Vishakhapatnam	Shri R. Ranjan Shri S. Mondal (*Alternate*)
SAIL, Bhilai Steel Plant, Bhilai	Shri D. B. Shrivastava Shri K. K. Kumar (*Alternate* I) Shri P. K. Datta (*Alternate* II)
SAIL, Bokaro Steel Plant, Bokaro	Shri G. B. Pradhan Dr M. M. S. Sodhi (*Alternate*)

Organization	*Representative(s)*
SAIL, Central Marketing Organization, Kolkata	Shri B. V. S. Pandit
SAIL, Durgapur Steel Plant, Durgapur	Representative
SAIL, Research & Development Center for Iron & Steel, Ranchi	Dr S. K. Chaudhuri Dr D. Mukherjee (*Alternate* I) Shri B. K. Panigrahi (*Alternate* II)
SAIL, Salem Steel Plant, Salem	Shri S. Sisodia Shri H. K. Arora (*Alternate*)
Steel Furnace Association of India, New Delhi	Shri M. S. Uninayar
Steel Re-rolling Mills Association of India, Mandi Gobindgarh	Shri R. P. Bhatia Shri H. D. Khera (*Alternate*)
Sunflag Iron & Steel Co Ltd, Faridabad Bhandara	Shri R. K. Malhotra Shri R. K. Verma (*Alternate*)
Tata Motors Limited, Pune	Shri J. D. Haridas Shri B. R. Galgali (*Alternate*)
Tata Steel Ltd, Jamshedpur	Dr Debashish Bhattacharjee Dr M. D. Maheshwari (*Alternate* I) Shri M. C. Sadhu (*Alternate* II)
Thyssenkrupp Electrical Steel India Pvt Ltd, District Nasik	Shri R. Prabhakar Shri J. Sreenivas (*Alternate*)
Usha Beltron Ltd, Kolkata	Shri S. N. Guha
Visvasvaraya Iron & Steel Ltd, Bhadrawati	Dr S. S. Anand
In personal capacity (*403, Udaigiri, Kaushambi, District Ghaziabad, U.P.*)	Shri N. Mitra
BIS Directorate General	Shri S. K. Gupta, Scientist 'F' & Head (MTD) [Representing Director General (*Ex-officio*)]

Member Secretary
Shri Deepak Jain
Scientist 'E' and Director (MTD), BIS

Flat Products Subcommittee, MTD 4 : 3

Tata Steel Ltd, Jamshedpur	Dr M. D. Maheshwari (***Convener***) Shri M. C. Sadhu (*Alternate*)
Apex Chambers of Commerce, Ludhiana	Shri P. D. Sharma
Essar Steels Ltd, District Surat	Shri R. K. Balasubramaniam Shri S. R. Bhatt (*Alternate*)
Federation of Engineering Industries of India, New Delhi	Shri H. L. Bhardwaj Shri H. L. Bansal (*Alternate*)
GKW Limited, Mumbai	Shri B. R. Bapat Shri Bhaskar Mazumdar (*Alternate*)
Indian Gas Cylinders, Faridabad	Shri E. M. Patel
Indian Oil Corporation Limited, Noida	Shri M. K. Jha Shri T. Bandhopadhyay (*Alternate*)
Ispat Industries Limited, Dolvi	Shri Rambriksh Singh Shri Rajendera K. Verma (*Alternate*)
Maruti Udyog Ltd, Gurgaon	Shri Srikanth Sudhir Shri Sunil Malhotra (*Alternate*)
The Tin Plate Company of India Ltd, Jamshedpur	Shri T. K. Ghosh Shri A. K. Ghosh (*Alternate*)
Verny Containers Ltd, Hyderabad	Shri P. K. Mathur

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : No. MTD 4 (4591).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 2323 01 31, 2323 33 75, 2323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	2323 76 17 2323 38 41
Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700 054	2337 84 99, 2337 85 61 2337 86 26, 2337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160 022	260 38 43 260 92 85
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600 113	2254 12 16, 2254 14 42 2254 25 19, 2254 23 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400 093	2832 92 95, 2832 78 58 2832 78 91, 2832 78 92

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

Printed at Prabhat Offset Press, New Delhi-2